[0241] When the state 3 is not identified, the procedure proceeds to step S14 from the branch "No" of the determination block S12, and it is further determined whether only the right hand of the user is placed on the keyboard 10 and the left hand is used to operate the portable telephone 50.

[0242] When the state 4, in which only the right hand of the user is used to operate the keyboard 10 and the left hand is used to operate the portable telephone 50, is identified, the procedure proceeds to step S16 from the branch "Yes" of a determination block S15, and a telephone memo application is activated and a right-hand keyboard mode in which a right-hand operation area of the keyboard 10 can be operated by one hand is automatically specified.

[0243] When the user applies a predetermined input operation to the user input apparatus 1, including the keyboard 10 and the mouse 30, the computer 200 connected to the user input apparatus 1 according to the present invention can execute user authentication processing by comparing and verifying multi-dimensional values (see **FIG. 14** and **FIG. 15**) detected by the human-body detection apparatus 70 (described before).

[0244] Authentication processing based on user inputs is divided into user registration processing serving as a pre-process for authentication, and authentication processing based on registered data.

[0245] In **FIG. 28**, the procedure of the user registration processing for registering multi-dimensional values from the human-body detection apparatus 70 is shown in a flowchart form. This processing procedure is implemented, for example, in a form in which the CPU 201 executes predetermined program code. The processing procedure for user registration will be described below by referring to the flowchart.

[0246] The user to be registered is made to press a predetermined key on the keyboard 10 (in step S21).

[0247] When the predetermined key is pressed, a multi-dimensional value obtained by the human-body detection apparatus 70 is stored as the identification information (ID) of the user to be registered (in step S22).

[0248] In **FIG. 20**, the procedure of the user authentication processing which uses the multi-dimensional values registered as the user identification information is shown in a flowchart form. This processing procedure is implemented, for example, in a form in which the CPU 201 executes predetermined program code. The processing procedure for user authentication will be described below by referring to the flowchart.

[0249] The user to be authenticated is made to press a predetermined key on the keyboard 10 (in step S31).

[0250] When the predetermined key is pressed, the distance between a multi-dimensional value obtained by the human-body detection apparatus 70 and each multi-dimensional value stored as the identification information (ID) of the user already registered (in step S32). The shortest distance obtained in the distance calculation is called L.

[0251] Then, it is determined whether the calculated shortest distance L is smaller than a predetermined threshold (in step S33).

[0252] When the shortest distance L is smaller than the threshold, the user being authenticated is recognized as a registered user (in step S34). When the shortest distance L is equal to or larger than the threshold, the computer refuses to recognize the user being authenticated (in step S35).

[0253] The user authentication method which uses multi-dimensional values obtained from the human-body detection apparatus 70, described above, allows authentication processing to be performed in a natural form, without imposing a special load on the user and without forcing the user to wear a special apparatus, such as an IC card.

[0254] When "pressing the predetermined key", described above, is changed to a password input, it is also possible to determine whether the password is input by the authorized person or by another person who impersonates the authorized person.

[0255] <<Note>>

[0256] *: The one-hand keyboard is, for example, described in a paper written by Edgar Matias, I. Scott Mackenzie, and William Buxton, "Half-QWERTY: A One-Handed Keyboard Facilitating Skill Transfer from QWERTY", Conference Proceedings on Human Factors in Computer Systems, 1993, pages 88-94.

[0257] Addition

[0258] The present invention has been described in detail by referring to the specific embodiments. It is obvious that persons skilled in the art can have modifications and alternatives of the embodiments within the scope of the present invention. In other words, the present invention has been disclosed in a form of illustrations, and should not be interpreted in a limited manner. To understand the scope of the present invention, the Claims described at the top should be considered.

INDUSTRIAL APPLICABILITY

[0259] According to the present invention, good user input apparatuses where the user can perform input operations by using part of the user's body as with a keyboard or a mouse, computers connected to the user input apparatuses and control methods for the computers connected to the user input apparatuses, and storage media can be provided.

[0260] In addition, according to the present invention, good user input apparatuses designed such that the user operates the apparatuses by both hands, computers connected to the user input apparatuses and control methods for the computers connected to the user input apparatuses, and storage media can be provided.

[0261] Further, according to the present invention, good user input apparatuses allowing the user to perform input operations without inconvenience even if the user cannot use one hand due to other work while the apparatuses are designed such that the user operates the apparatuses by both hands, computers connected to the user input apparatuses and control methods for the computers connected to the user input apparatuses, and storage media can be provided.

[0262] According to the present invention, a system can appropriately switch processing according to the state of a user's hand even if the user of a computer does not give an explicit command for switching the input mode.